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Reg. No. : .....

Name : .....

ST. JOSEPH'S COLLEGE LIBRARY TRIVANDRUM

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme Under CBCSS

Chemistry

Core Course – III

CH 1441 : ORGANIC CHEMISTRY – I

(2020 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions. Answer in **one** word to maximum two sentences. **Each** question carries **1** mark.

1. What are nucleophiles?
2. Define reaction mechanism.
3. What is a racemic mixture?
4. Name the catalyst commonly used for Friedel-Craft's alkylation?
5. What are annulenes?
6. What are dyes?
7. What will be the major product formed when propene is treated with HBr?
8. Give an example for electrocyclic reaction.

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9. Among the following which is the strongest nucleophile? H_2O, HO^-, Cl^- and tert-BuO^-.

10. What are chromaphores?

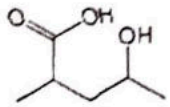
(10 × 1 = 10 Marks)

SECTION – B

Short answer type. Answer **any eight** questions. **Each** question carries **2** marks.

11. What are the different types of arrows used to represent the electron movement while depicting reaction mechanism?

12. Write the IUPAC name for the following compound:



13. Halogens are electron withdrawing yet they direct the incoming electrophile to o/p-positions. Why?

14. What is meant by photosensitization?

15. Explain any one method to distinguish geometrical isomers.

16. What is meant by optical activity?

17. Distinguish between erythro-and threo-isomers.

18. Phenol is acidic while ethanol is not. Why?

19. Distinguish between enantiomers and diastereomers.

20. Explain cycloaddition reaction with a suitable example.

21. State and explain Saytzeff rule.

22. Explain Kharasch effect with a suitable example?

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23. What is asymmetric synthesis?

24. What is *cis*-dihydroxylation?

25. Draw the Fischer projection formula for D- and L-glyceraldehyde.

26. Among 2-butene and 1-butene which is more stable? Justify your answer.

(8 × 2 = 16 Marks)

SECTION – C

Short essay type. Answer **any six** questions. Each question carries **4** marks.

27. Explain the orientation effect of mono substituted benzene in aromatic electrophilic substitution reactions.

28. Naphthalene undergoes electrophilic substitution reactions preferentially at α-position. Explain.

29. What are pericyclic reactions? How they are classified? Explain each.

30. Write a note on optical brighteners.

31. Discuss about the conformers of mono and dialkyl substituted cyclohexanes.

32. Discuss the optical activity of tartaric acid.

33. Write a note on the stereochemistry of S_N reactions.

34. Explain the regioselectivity in the addition of HX to carbon-carbon double bonds.

35. What is inductive? How does it influence the acidity of organic acids?

36. Discuss any two methods for the determination of reaction mechanism.

37. Explain Bayer's strain theory.

38. Explain anchimeric assistance in nucleophilic substitution reactions.

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SECTION – D

Answer **any two** questions. **Each** question carries **15** marks.

39. Discuss with suitable examples, structure, formation, stability and reactions of carbocations, carbanions and free radicals.

40. Discuss

    (a) Aromaticity of benzenoid and nonbenzenoid compounds based on Huckel's mies.

    (b) Elimination-addition mechanism of aromatic nucleophilic substitution reactions.

41. Describe the preparation and use of the following dyes.

    (a) Methyl orange

    (b) Crystal violet

    (c) Congored

42. Write a note on

    (a) Cahn-Ingold-Prelog rules

    (b) Atropisomerism

43. Discuss the conformations of n-butane and their stability with the help of an energy profile diagram.

44. Discuss

    (a) Effect of nature of substrate and solvent in S_N reactions.

    (b) Regioselectivity in elimination reactions.

(2 × 15 = 30 Marks)

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